WHAT IS CLAIMED IS:

1. A method of forming a conformal electronic scanning array, the method comprising:

providing a substrate;

establishing a plurality of receptor structures in the substrate;

creating a first conductive passage, associated with each receptor structure, through the substrate;

applying a plurality of transmit/receive circuitry units to a surface of the substrate such that each of a substantial portion of the receptor structures are filled by a transmit/receive circuitry unit disposed therein, wherein a first electrical contact on each transmit/receive circuitry unit is positioned to be electrically connected with the first conductive passage;

applying a first dielectric layer to the substrate;

applying a first conductive layer to the first dielectric layer;

applying a second dielectric layer to the first conductive layer;

applying a second conductive layer to the second dielectric layer; and

etching the second conductive layer to form a plurality of radiating elements, each of the plurality of radiating elements being disposed adjacent one of the plurality of transmit/receive circuitry units such that a radiating element, a second contact on a transmit/receive circuitry unit, and the first conductive ground plane, cooperate to form an active radiating element controlled by the transmit/receive circuitry unit.

2. The method of claim 1, further comprising:

applying a protective layer on the plurality of radiating elements.

3. The method of claim 1, wherein the substrate, the dielectric layer and the second conductive layer are substantially transparent.

4. The method of claim 3, wherein the substrate is operationally attached to a display element configured to be viewed through the substrate, the dielectric layer and the second conductive layer.

5. The method of claim 1, wherein creating the first conductive passages is at least partially accomplished using a laser.

6. The method of claim 1, further comprising providing each of the plurality of transmit/receive circuitry units with a first set of contacts and a second set of contacts, wherein each of the contacts in the first set of contacts is configured to be connected to an electrical connection when its respective transmit/receive circuitry unit is positioned in a receptor structure in a first orientation, and further wherein each of the contacts in the second set of contacts is configured to be connected to an electrical connection when its respective transmit/receive circuitry unit is positioned in the receptor structure in a second orientation.

7. The method of claim 1, wherein the surface of the substrate is a first surface, the method further comprising:

applying a conductive RF manifold layer to a second surface of the substrate;

forming a plurality of RF contacts from the RF manifold layer, each RF contact being aligned with one of the first conductive passages such that the first contact on each transmit/receive circuitry unit is electrically connected, through a first conductive passage, to one of the RF contacts.

8. The method of claim 7, wherein each transmit/receive circuitry unit includes a power contact and a control contact thereon, and further comprising:

creating a second conductive passage and a third conductive passage, within each receptor structure, through the substrate;

connecting the power contact, through the second conductive passage, to a first connection on a conductive power/control manifold layer to thereby provide power to the transmit/receive circuitry unit; and

connecting the control contact, through the third conductive passage, to a second connection on the conductive power/control manifold layer to thereby provide control signals to the transmit/receive circuitry unit.

9. A conformal electronic scanning array, comprising:

a substrate having a first surface and a second surface;

a plurality of receptor structures formed in the substrate;

a plurality of vias formed in each receptor structure, through the substrate;

a plurality of transmit/receive circuitry units applied to the first conductive layer and operative to fit into any of the plurality of receptor structures, wherein each of the transmit/receive circuitry units have a plurality of electrical contacts disposed thereon, and further wherein each of the transmit/receive circuitry units are configured to accommodate at least one of sending and receiving electronic communications;

wherein the plurality of vias are configured to be aligned with a corresponding number of electrical contacts disposed upon a transmit/receive circuitry unit that fits into the respective receptor structure to provide at least one of a power input and a control input to the transmit/receive circuitry unit;

an antenna element operationally connected to the transmit/receive circuitry unit.

10. The conformal electronic scanning array of claim 9, further including:

a first dielectric layer applied on the transmit/receive circuitry units;

a first conductive layer applied on the first dielectric layer and etched to form a plurality of non-conductive voids;

a second dielectric layer applied on the first conductive layer and configured to fill the plurality of non-conductive voids;

a second conductive layer applied to the second dielectric layer and etched to form a plurality of radiating elements, wherein each of the radiating elements is associated with an RF contact on one of the transmit/receive circuitry units to form the antenna element therewith.

11. The conformal electronic scanning array of claim 10, wherein the substrate, the dielectric layer and the first and second conductive layers are substantially transparent.

12. The conformal electronic scanning array of claim 9, wherein the substrate is formed of one of a dielectric material and a semiconductor material.

13. The conformal electronic scanning array of claim 9, wherein each of the receptor structures and transmit/receive circuitry unit have a complementary topology that permits each of the transmit/receive circuitry unit to fit into a respective receptor structure only when the transmit/receive circuitry unit is oriented in one or more predetermined directions with respect to the respective receptor structure.

14. The conformal electronic scanning array of claim 10, wherein the substrate, the dielectric layer and the first and second conductive layers cooperate to form a flexible, bendable structure.

15. The conformal electronic scanning array of claim 9, further comprising:

a first conductive manifold layer applied to the second surface of the substrate, the first conductive manifold layer being etched to form thereupon an RF connection that is electrically connected, through one of the plurality of vias, to a second RF contact on the transmit/receive circuitry unit, to thereby provide a means of sending and receiving RF signals to and from the antenna element.

16. The conformal electronic scanning array of claim 15, wherein the electrical contacts disposed upon each transmit/receive circuitry unit include a power contact and a control contact, the invention further comprising:

a third dielectric layer applied to the first conductive manifold layer; and

a second conductive manifold layer that is etched to form thereupon

a control connection that is electrically connected, through one of the plurality of vias, to the control contact on the transmit/receive circuitry unit to provide a control input thereto, and

a power connection that is electrically connected, through one of the plurality of vias, to the power contact on the transmit/receive circuitry unit to provide a power input thereto.

17. The conformal electronic scanning array of claim 16, further including:

a conductive ground plane layer disposed upon the third dielectric layer;

a fourth dielectric layer disposed upon the conductive ground plane layer, wherein the second conductive manifold layer is applied to the fourth dielectric layer;

wherein the conductive ground plane layer electromagnetically isolates the first conductive manifold layer from the second conductive manifold layer.

18. An electronics device including a display component and a conformal electronic scanning array secured to a viewable surface of the display component between the display and a viewer, and wherein the conformal electronic scanning array comprises:

a substrate having a first surface and a second surface;

a plurality of receptor structures formed in the first surface of the substrate;

a plurality of vias formed in each receptor structure, through the substrate;

a plurality of transmit/receive circuitry units applied, in a slurry, to the first surface of the substrate and operative to fit into any of the plurality of receptor structures, wherein each of the transmit/receive circuitry units have a plurality of electrical contacts disposed thereon;

wherein the plurality of vias are aligned with a corresponding number of electrical contacts disposed upon a transmit/receive circuitry unit when said circuitry unit is set in a receptor structure, so that the plurality of vias provide at least one of a power input and a control input to said circuitry unit;

a first dielectric layer applied on the transmit/receive circuitry units;

a first conductive layer applied on the first dielectric layer;

a second dielectric layer applied on the first conductive layer;

a second conductive layer applied to the second dielectric layer and etched to form a plurality of radiating elements, wherein each of the radiating elements is associated with an RF contact on one of the transmit/receive circuitry units to form an active radiating element therewith;

wherein the substrate, the dielectric layer and the first and second conductive layers are substantially transparent.

19. The communications device of claim 18, wherein the display component is one of a computer screen and an LCD display.

20. The conformal electronic scanning array of claim 18, wherein the substrate, the dielectric layer and the first and second conductive layers cooperate to form a flexible, bendable structure.